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Compliance with Oral Anti-Diabetic Treatment in Lome

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Abstract

Objective: The objective of this study was to assess adherence to antidiabetic therapy in type II diabetic patients and factors associated with Lomé. **Method:** This was a descriptive observational study conducted among diabetics in diabetes care centers from May 1, 2020 to October 1, 2020, for a period of 6 months. **Results:** A total of 300 patients were questioned. The mean age was 56.61 years (standard deviation = 11.7). The sex ratio was 0.6. All the patients were on drug treatment, 83.4% of whom were on metformin and 37.5% on Glibenclamide. In 58.3% of the cases, the patients were on dual therapy and 96.2% had an above-normal glycated hemoglobin value. There was a medication adherence problem with poor adherence in 30.7%. Being aged 50 and over (ORC = 1.78, p = 0.048), playing sports (ORR = 1.87, p = 0.046), have reaching a higher level of education (ORR = 5.78, p = 0.005) significantly increased the chances of patients having a good/minimal problem of adherence. **Conclusion:** Diabetes affects in Togo, more women than men with a predominance of those aged 50 and over. Adherence to therapy remains a challenge.

Keywords

Type II Diabetes, Metformin, Compliance, Associated Factors

1. Introduction

Diabetes mellitus is a public health issue throughout the world, particularly in sub-Saharan Africa, where its ever-increasing prevalence of 8.5% is a major concern [1]. The prevalence of diabetes mellitus has increased rapidly throughout the world and has reached epidemic proportions. It is estimated that there are currently 285 million people with diabetes in the world and this number is

expected to rise to 438 million by 2030 [2]. Glycaemic control is essential in preventing the chronic complications of diabetes mellitus. Although effective drugs and well-established treatment protocols exist, this balance is not always achieved, and good adherence to treatment is also a factor in glycaemic control. Poor compliance with long-term treatments for chronic diseases such as diabetes mellitus is one of the main causes of glycaemic imbalance [3].

Compliance refers to the patient's attitude of conforming to the rules drawn up by consensus by healthcare professionals and following their prescriptions [4]. For the World Health Organisation (WHO), adherence is "the extent to which the behaviour of a person required to take medication, follow a diet and/or make lifestyle changes corresponds to the recommendations agreed with a healthcare professional" [5].

Adherence to diabetes treatment is beneficial in reducing the risk of diabetes-related complications. Adherence is influenced by a number of factors relating to patients, drugs and healthcare institutions. For patients, age, socio-economic conditions and level of education can influence adherence to treatment. The intensity of symptoms and the severity of the disease are factors that can affect the dose of medication to be administered by the patient [6]. The aim of the present study was therefore to assess adherence to antidiabetic treatment among type II diabetic patients in Lomé.

2. Material and Method

This was a descriptive and analytical observational study that took place from 1 May 2020 to 1 October 2020, a period of 6 months, in the Internal Medicine and Metabolic Endocrinology Department of the Sylvanus Olympio University Hospital Centre (CHU-SO) and at the Togolese Diabetes Association (ATD) centre. Our study population consisted of patients monitored in the Department of Internal Medicine and Metabolic Endocrinology and followed up at the center of the Togolese Diabetes Association.

Type II diabetic patients who had been on oral anti-diabetes (ADO) for at least 6 months and who agreed to take part in the survey were included in the study. Type II diabetic patients on ADO who refused to participate in the survey and/or type II diabetic patients on ADO who were absent from appointments during the study period were not included in the study.

To collect the data, we met the patients at the end of the consultation, and then the registers and consultation notebooks were searched for information on these diabetic patients. Observation was used to report the data. The parameters studied were socio-epidemiological data (age, sex, profession, level of education, marital status, monthly income), clinical data (type of diabetes, duration of the disease), para-clinical data (use of a blood glucose meter, blood glucose levels, glycated haemoglobin) and therapeutic data (type of medication, number of tablets taken, frequency of use, any changes in medication, side effect, running out of medication, the reason for running out of medication,).

The following parameters were defined as follows:

• Patients in employment: we considered patients in employment those respondents who were working in the private or public sector and who had not retired.

• Patients with no income-generating activity: these were patients who had no activity or were unemployed but not retired.

• Retired patients: these are patients who were receiving a retirement pension and who had a secondary activity.

• Retired patients with no activity: these are patients who had worked and were retired and living solely on their retirement pension.

Gired questionnaire: the aim of this questionnaire is to measure patients' compliance with medication during treatment and, if necessary, to determine the factors explaining poor compliance.

• Girerd score [7]: the carer questions the patient or the patient response autonomously with "yes" or "no" to the 6 questions, "yes" has a value of 1 point, "no" has a value of 0 points, the sum gives a score of between 0 and 6; a score of 0 corresponds to good compliance, a score of 1 or 2 corresponds to a minimal compliance problem and poor compliance corresponds to a score of 3 or more.

• Given the small number of people in the "good compliance" category, we thought it wise to group together the "good compliance" and "minimal compliance problem" categories.

Data was entered using EPI data software.

The results were presented in tables of numbers and proportions for the qualitative variables. Quantitative variables were presented as means (± standard deviation). Categorical variables were compared using the chi-square test of independence. Binary logistic regression was performed to describe the factors associated with good/minimal compliance. Factors with a p-value < 0.20 in the univariate analysis were considered for the full multivariate model, which was then finalised using a top-down stepwise approach at the 5% significance level. All analyses were performed using R© statistical software.

3. Results

3.1. Description of the Sample

We recorded a total of 300 patients in consultation during our study period, 65.3% of whom came from the ATD and 34% from the CHU-SO. Women predominated (62%), with a M/F sex ratio of 0.6. The average age of those surveyed was 56.61 years (standard deviation = 11.7), with extremes of 27 and 88 years. The 55 - 65 age group accounted for 34%, and the 45 - 55 age group 27%.

In terms of level of education, 26.7% of respondents had not attended school, and 27.3% had completed primary education. With regard to employment status, 73.3% of respondents had an income-generating activity, while 15.0% had no income-generating activity.

3.2. Therapeutic Compliance

In our study, 12% of respondents had forgotten to take their treatment on the

day of the appointment with the healthcare provider, and 156 (52%) patients had run out of medication between their last consultation and the day of the appointment. In addition, 96.3% of those surveyed did not take their medication at regular times (Table 1).

3.3. Main Characteristics of Compliance with ADO Treatment

Respondents aged 50 and over were relatively more compliant than those under 50, with proportions of 72.1% and 60.8% respectively; this difference was significant (p = 0.047). Male respondents were also more compliant (73.7%) than female respondents (66.7%), but this difference was not significant (p = 0.201). In addition, respondents with a higher level of education had better compliance with a significant difference (p = 0.003) than those with less than a higher level of education (91.2% versus 66.5%). However, there was no correlation between compliance with oral antidiabetics and the practice of sporting activities, the presence of a comorbidity such as hypertension or alcohol consumption. (Table 2).

3.4. Level of Compliance Measured Using the Gired Score

Three out of ten respondents (30.7%) had poor compliance, while only 2.3% had good compliance (Figure 1).

Table 1. Distribution of respondents according to compliance.

	Number	Percentage
Forgot to take medication this morning		
No	264	88.0
Yes	36	12.0
Ran out of medication since last visit		
Yes	156	52.0
No	144	48.0
Medication taken later than usual		
Yes	289	96.3
No	11	3.7
Forgetting to take medication because of forgetfulness		
No	248	82.7
Yes	52	17.3
Not taking medication because of a feeling of doing more harm than good		
No	283	94.3
Yes	17	5.7
Too many pills to take		
No	226	75.4
Yes	74	24.6

Table 2. Distribution of respondents according to their characteristics and compliance.

	Compliance of treatment			P*
	Poor	Good/Minim problèm	Total	
	N = 92	N = 208	N = 300	
Age (years)				**0.047**
Less than 50	29 (39.2)	45 (60.8)	74	
50 and over	63 (27.9)	163 (72.1)	226	
Practice of sport				0.170
No	31 (36.5)	54 (63.5)	85	
Yes	61 (28.4)	154 (71.6)	215	
Sex				0.201
Famale	62 (33.3)	124 (66.7)	186	
Male	30 (26.3)	84 (73.7)	114	
HTA				0.897
No	37 (31.1)	82 (68.9)	119	
Yes	55 (30.4)	126 (69.6)	181	
Education level				**0.003**
Primary and et Secondary	89 (33.5)	177 (66.5)	266	
High education	3 (8.8)	31 (91.2)	34	
Occupation level				0.286
Not in employment	17 (25.4)	50 (74.6)	67	
In employment	75 (32.2)	158 (67.8)	233	
Alcohol consumption				0.665
No	85 (31.0)	189 (69.0)	274	
Yes	7 (26.9)	19 (73.1)	26	

*Chi-square test; HTA: high blood pressure.

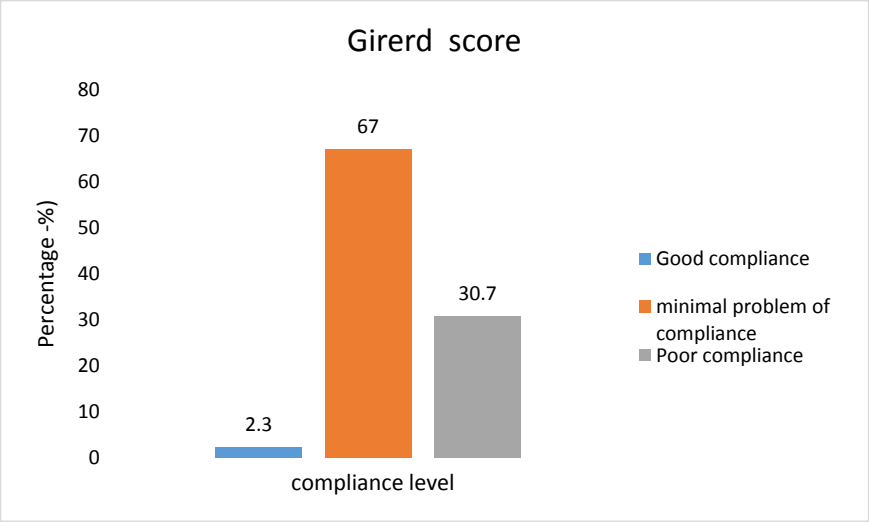

Figure 1. Distribution of respondents according to compliance with their treatment (Girerd score).

3.5. Factors Associated with Compliance

Univariate analysis was used to eliminate variables with p-values greater than 20%. Thus, at this 20% threshold, the variables associated with good/minimal compliance problems were age, participation in sports and level of education. In multivariable analysis, after adjustment, all the factors were found to be associated with a good/minimal compliance problem. Being aged 50 and over (ORa = 1.78, p = 0.048), practising sports (ORa = 1.87, p = 0.046) and having a higher level of education (ORa = 5.78, p = 0.005) significantly increased patients' chances of having a good/minimal compliance problem. On the other hand, certain parameters such as sex, profession, hypertension, or alcohol consumption were not factors associated with therapeutic compliance in multivariate analysis (Table 3).

Table 3. Factors associated with compliance.

	Univariable			Multivariable		
	OR	CI to 95%	p	aOR	CI to 95%	p
Age (years)						
Less than 50	-			-		
50 and over	1.67	0.96 - 2.88	**0.068**	1.78	1.10 - 3.14	**0.048**
Practice of sport						
No	-			-		
Yes	1.45	0.85 - 2.46	**0.172**	1.87	1.07 - 3.13	**0.046**
Sex						
Female	-			-		
Male	1.40	0.84 - 2.37	0.202	-		
HTA						
No	-			-		
Yes	1.03	0.62 - 1.70	0.897	-		
Education level						
Less than high education	-			-		
High education	5.20	1.79 - 22.06	**0.008**	5.78	1.96 - 24.87	**0.005**
Occupation level						
Not in employment	-			-		
In employment	0.72	0.38 - 1.30	0.288			
Consumption of alcohol						
No	-			-		
Yes	1.22	0.51 - 3.22	0.665	-		

OR: odds ratio; aOR = adjusted odds ratio; 95% CI = 95% confidence interval; hypertension: arterial hypertension.

4. Discussion

4.1. Methodology

Our study was the first to be carried out in the internal medicine and metabolic endocrinology department of the CHU SO and in the offices of the ATD in Lome, with the aim of evaluating compliance with oral antidiabetic drugs. During the course of our study, we were confronted with the difficulties and limitations inherent in descriptive observational studies. These difficulties were the refusal of some patients to answer questionnaires and the language of communication. Despite these difficulties, the results obtained enable us to assess the main epidemiological. The main epidemiological characteristics, and the factors at the origin of good/minimal compliance with oral antidiabetic therapy.

4.2. Discussion of Results

We recorded 300 cases of diabetic patients during our study period; this result is higher than that of Ntyonga-pono *et al.* in Gabon in March 2015, who obtained 103 cases of diabetes [8]; and that of Rwegerea *et al.* [9] in Tanzania in April 2014, who reported 206 cases of diabetes, lower than that of Kalyango *et al.* [10] in Uganda in 2008, who reported 402 cases of diabetes. This variability in frequency could be linked to the size of the population, the number of health facilities available to treat the disease, etc.

In our study, the 55 - 65 age group was the most represented (34%), followed by the 45 - 55 age group (27%). The average age of patients was 51.61 years (with extremes ranging from 27 to 88 years), lower than the study by Tiéno *et al.* [3] in Burkina Faso, who reported an average age of 53.5 years (extremes: 22 - 87 years). Similarly, Rwegerea *et al.* in Tanzania reported a median age of 55 years, with extremes ranging from 34 to 81 years [9], while Wanvoegbe *et al.* in Benin reported a median age of 54.67 years [11]. In Gabon, Ntyonga-pono *et al.* reported 30.1% in the 51 - 60 age group, followed by 17.47% in the 41 - 50 age group [8]. Kalyango *et al.* in Uganda reported 52.0% in the 18 - 50 age group followed by 48.0% in the 51 - 88 age group [10]. The majority of patients were female (62%), giving a sex ratio M/F of 0.6. These results corroborate those of Rwegerera *et al.*, who in their study in Tanzania reported a predominance of women, with more than two-thirds suffering from diabetes [9], and the studies of Wanvoegbe *et al.* in Benin, who reported 70% of women [11]. In our study, 70.7% of respondents had primary, secondary or higher education. In their study in Burkina Faso, Tieno *et al.* reported 51.9% of those enrolled.

Regarding compliance, one hundred and fifty-six (156) patients had run out of medication between their last consultation and the day of the appointment, therefore a proportion of 52% in our series. This is related to the high cost of treatment.

Respondents aged 50 and over were relatively more compliant than those under 50, with proportions of 72.1% and 60.8% respectively; this difference was significant ($p = 0.047$). Male respondents were also more compliant (73.7%)

than female respondents (66.7%), but this difference was not significant (p = 0.201). In addition, respondents with a higher level of education had better compliance with a significant difference (p = 0.003) than those with less than a higher level of education (91.2% versus 66.5%).

In terms of compliance level, compliance with oral antidiabetic treatment varies from 36% to 93% according to the authors. Optimal compliance with OAD treatment was reported by 69.3% of patients in our study, which is higher than the rate reported by Tiéno *et al.* [3], which was 46.8% in Burkina Faso in 2010. Nearly a third (30.7%) of our patients had poor compliance with treatment, which is lower than the rate reported by Ntyonga-pono *et al.* [8] in Gabon, who reported 39.8% non-compliance. According to this meta-analysis carried out in Tunisia [12], poor compliance is a frequent and multifactorial problem among type 2 diabetics in North African countries. Several observational studies and meta-analyses have sometimes produced results similar to our study, sometimes far from it. In Malaysia, two studies, one conducted by Janno *et al.* in 2018 on a sample of 497 type 2 diabetic patients and the other, in 2013, conducted by Ahmad *et al.* on a sample of 557 type 2 diabetics, revealed poor compliance of 44.7% and 53% respectively [13] [14]. In Canada, in 2013 Guénette *et al.* estimated a non-adherence rate of 22% in a sample of 151173 type 2 diabetics [15]. A study carried out in Quebec in 2014 by Simard *et al.*, on a sample of 160231 type 2 diabetes patients, revealed that 33% of patients questioned were non-adherent [16] (39). A meta-analysis in Ethiopia, conducted by Yazewa *et al.* in 2019 of 22 studies, showed that 30.5% of type 2 diabetics were non-adherent [17] (13). In the Middle East and North Africa region, a 2017 systematic review of 30 studies by Jaam *et al.* estimated a non-adherence rate of 38.3% [18] (40). Two surveys carried out in the United States, one in 2013 by Curkendall *et al.* on a group of 117 patients and the other by Tunceli *et al.* in 2015 on a sample of 133,449 people, revealed that respectively 51.7% and 41% of type 2 diabetics questioned were non-adherent [19] [20]. Similarly, our rate of poor compliance was higher than the result obtained in Uganda by Kalyango *et al.* [10], which was 28.9%. Therapeutic compliance is a problem throughout Africa and Togo.

According to Girerd's therapeutic evaluation questionnaire, we obtained only 2.3% good compliance compared with 9.1% good compliance in Benin in the studies by Wanvoegbe *et al.*; 30.7% of our respondents were poorly compliant compared with 19.7% who were poorly compliant in the study by Wanvoegbe *et al.* [11]. These figures are lower than those for France and the United States, where 39% of patients reported satisfactory compliance, followed by average and poor compliance, which were 49% and 12% respectively. This may be linked to the high cost of medicines and the fact that part of the population is covered by social security in our country.

For diabetes control, we found during our investigation that 69% of patients had never had a glycated haemoglobin test, and 96.2% of patients who had had a glycated haemoglobin test at least once did not have their diabetes under control. This rate of uncontrolled diabetes was much higher than the rate in the

study by Wanvoegbe *et al.* [11], who reported 77% of unbalanced diabetes.

In the same way, we reported that 1.4% of patients modified their treatment for financial reasons and nineteen percent (19%) changed the treatment themselves because it was ineffective.

Finally, concerning the factors associated with the compliance, male respondents had better compliance (73.7%) than female respondents (66.7%) but this difference was not significant ($p = 0.201$). In addition, respondents with a higher level of education had better compliance, with a significant difference ($p = 0.003$) than those with less education (91.2% versus 66.5%). Through a better understanding of the objectives of treatment, the level of education should lead to adherence to treatment, and then better compliance. In a study carried out in Burkina Faso, Tiéno *et al.* found a significantly higher illiteracy rate among poorly compliant diabetic patients than among compliant patients [3]. In the same way, in our series respondents over 50 years of age were more compliant (72.1%) than those under 50 years of age, with a significant difference. This difference in the level of compliance may be linked to the fact that the older subjects have acquired experience and a better understanding of the disease than the younger ones, which leads them to adhere more closely to treatment.

High-level educational respondents were more observant than those without a higher level of education; it should be noted that those with a higher level of education have more knowledge of the pathophysiology and complications of pathologies in the event of poor compliance, and this being the case, good adherence to treatment would be a necessity for them. People who practice sports are also more observant. The practice of sport or physical activity is the first therapeutic means included in the hygienic-dietary regime, so those who practice sport had a better understanding of the different therapeutic means and their beneficial effects on health, which allowed good adherence to treatment. Practicing sports and attaining a higher level of education significantly increased patients' chances of having a good/minimal compliance problem. According to Ntyonga-pono *et al.* in Gabon, the factors associated with non-adherence were the cost of medication, beliefs and fatigue [8]. In Benin, Wanvoegbe *et al.* noted that monthly income and blood pressure were factors favouring poor compliance with treatment [11].

5. Conclusion

This was a descriptive and analytical observational study conducted over a period of six months, the aim of which was to assess adherence to treatment among type II diabetics in Lomé and the associated factors. There was a problem of minimal and poor compliance among type II diabetics. The factors associated with good compliance were age over 50, the practice of sport and a high level of education. These results should prompt other national studies to evaluate compliance with antidiabetic treatment and to implement strategies to reinforce therapeutic education.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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